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The Captain is the first Man I ever heard of that took notice of a Red Streak of Light preceding the emerſion of the Sun's body from a total Eclipse. And I take notice of it to you, becauſe it infers that *the Moon has an Atmosphere*; and its ſhort continuance of only 6 or 7 Seconds of Time, tells us that *its height is not more than the 5 or 6 hundredth part of her diameter.*

VI. *An Abſtract of a Letter written from Geneva, May the 31th, 1706. N. S. by Monsieur J. Chr. Facio Duillier, R. S. S. to his Brother Mr Nic. Facio, R. S. S. Containing ſome Obſervations of the Sun's Eclipse, on the 12th of May, 1706. N. S.*

THe total Eclipse of the Sun, which happened on the 12th of May, 1706. N. S. did preſent to the Inhabitants of *Geneva* a magnificent and ſurprizing Sight. Theſe more Learned did obſerve that Eclipse with much Satisfaction: But it did ſtrike many of the Common People with a great deal of Terror. A little after the Sun's riſing, the Sky did ſeem clear; tho the Air was thick already with ſome Vapours. Many little Clouds did afterwards ariſe here and there, and the Vapours did much encreaſe. For want of a Pendulum Clock, in a convenient place, the Moment of the total Immerſion, the Moment of the firſt Emerſion, and that of the End of the Eclipse, could not be accurately obſerved. Tho the Sky was ſomewhat overcaſt, the Heat of the Sun was already felt, when the Eclipse did begin: But a very ſenſible Coldneſs took place, as the Moon did, by degrees, cover

cover a greater and greater part of the Sun, and the Light decrease. The Eclipse was observed only with some Glasses, either darkned with Smoak, or but little transparent; and by receiving the Sun's Image, through a six foot Telescope, which represented the Objects inverted, upon a white Paper, placed at some Distance, from the Eye-Glass. When the Sun was near being totally dark, the bright Crescent, which did remain, was seen to diminish more and more, upon the Paper, where its Image was received. And when that Crescent was reduced to a very narrow Breadth, and to a very little Length, it was seen of a sudden to disappear: And in that Moment the whole Sun was eclipsed. At the same Instant of Time, the Darkness, which was already very considerable, did become much greater. The Clouds did change of a sudden their Colour, and became Red, and then of a pale Violet. There was seen, during the whole Time of the total Immersion, a Whiteness, which did seem to break out, from behind the Moon, and to encompass it on all sides equally. The same Whiteness was but little determined, in its outward Side, and was not broad the twelfth part of the Diameter of the Moon. This Planet did appear very black, and her Disk very well defined, within the Whiteness, which encompassed it about, and whose Colour was the same, with that of a White Crown, or *Halo*, of about four or five Degrees in Diameter, which accompanied it, and had the Moon for its Center. The Star of *Venus* was seen, at the same time, at some Distance, without that Crown, between the East and N. E. in reference to the Sun. The Planets of *Saturn* and *Mercury* were seen also by many, Eastward from the Sun's place. And if the Sky had been clear, many more Stars might have been seen, and with them the Planets of *Jupiter* and *Mars*; that towards the East, and this toward the West: And so the seven Planets might have been seen, almost all at once. Accordingly
some

some Gentlewomen, being in the Country, did tell, as is said, more than sixteen Stars. And many people, which were on the Neighbouring Mountains, did see the Sky Starry, in some places, where it was not overcast, as during the Night, in the time of the full Moon. The total Immersion did begin about three Quarters past nine. The Duration of the total Darknefs was precisely three Minutes, or 180 Seconds; to the Moment that the first Ray of the Sun did begin to appear again, with much Brightness. And this Time was observed, with a simple Pendulum; which was afterwards compared with a Pendulum Clock, shewing the Seconds, and regulated upon the mean Motion of the Sun. The Council was met, during the time of the Eclipse; but they did rise from their Seats, a little before the total Obscuration; because one could neither read nor write. They perceived, as they came down the Stair-case of the Town-House, some Swallows amazed, looking for a resting place; and many Bats flying out. In other places the Hens and Pigeons would make haste towards their Houses. There were seen, in several places of the Town, some Persons of the *Roman* Religion, and among them two Priests, prostrate on the Ground, and praying; thinking that the last Day was come. A little after the Sun had began to appear again, the Whiteness and the Crown, which did encompass the Moon, did entirely vanish. The Sun did then shew itself more and more; appearing at first as a little Crescent, which did still increase; and whose Concave Side did seem terminated, as by an Arch, described with the Compass. A little before the total Obscuration, the Country, on the West Side, did already seem overcast with Darknefs; and after the total Obscuration, the Darknefs was seen to leave us more and more, and to fly Eastward. According to Mr Professor *Gautier's* Observations, from the first Emer-
sion of the Sun, to the End of the Eclipse, there was

1^h 9' 30". As to the accurate times they are uncertain, the Pendulum Clock having been set only by a small Sun Dial. I send you also the following Account, which the same Gentleman did communicate to me.

" Observations on the Eclipse of the Sun, of the
 " 12th of May, 1706, made at *Marseilles*, in the
 " Observatory of the *Jesuits* of *St Croix*; by
 " Monsieur *Chazelles*, Ingineer of the Gallies,
 " and by Father *Laval*, *Jesuit*, Royal Professor
 " of Hydrography.

	h	'	"
" The Eclipse did begin at —————	8	28	40
" It did reach the Sun's Center at ————	9	6	11
" It was total at —————	9	34	15
" The Sun did begin to appear again at	9	37	9
" The Eclipse did come again to the Center at	10	12	23
" It did entirely end at —————	10	47	50

" Three Stars were distinctly seen; and during three
 " Minutes it was not possible to read. And there did re-
 " main one bright Digit, all about the Globe of the
 " Moon.

The Mannor House of *Duillier* is in the Latitude of 46° 24'. In Longitude it is 4° 13' 45" to the Eastward of the *Royal Observatory* at *Paris*. And *St Peter's Church* at *Geneva* is, in Latitude, 0° 12' to the Southward, and in Longitude, 0° 5' 2" to the Westward of *Duillier*. But of this another time.

Before I make an end of this Abstract, I must take notice that, according to these Observations, the Altitude of the Moon's Atmosphere cannot well be supposed less than of 130 Miles, in perpendicular Height: Of which Miles 60 go to one Degree of the Earth. Neither could that Atmosphere be discovered, before the time of this Eclipse, by any Refraction of the Stars: Probably because of this Refraction's smallness; and for want of pro-

proper Observations. And tho it was very plain that the Atmosphere of the Moon must needs shew itself, in the time of a total Eclipse of the Sun; yet I do not know that any body did think of this, till, in the last Month of *May*, many Persons did actually see it. Such as have read Monsieur *Hugens's Cosmo-Theoros* may guess how much this Discovery would have been acceptable to that Illustrious Author.

Some particular Observations, which are intended to be made publick, do evince that our Atmosphere is sometimes visible, all along, from the Surface of the Earth to the perpendicular Height of one Semidiameter of the Terrestrial Globe. And the continued Appearance of a Crown, of only four or five Degrees Diameter, about the Sun, during the whole time of the total Obscuration, does shew that the Æthereal Matter, in which that Crown was produced, must be at a very great Height above the Surface of the Earth. But if that Crown was to be seen, so far as the Weather did permit, in all the Places, where the Eclipse was total, it must be concluded, that the Cause of it was not in our Air, but in some Vapours incompassing the Sun: And probably, in those very Vapours, which produce that pointed Light, that has been observed lying in a manner along the Ecliptick, and that has the Sun for Center. Now either of these Conclusions, *viz.* concerning the great Height of the parts of our Atmosphere, capable of producing that Crown, or else concerning a Meteor observed, not in our Air, but in the Vapours that incompass the Sun, is very singular, and deserves a great deal of attention. If ever such another Appearance should be seen, in the time of a total Eclipse, it would be proper to observe accurately the least Diameter of the Crown, from inside to *inside*: And to take notice whether, during the whole time of the total Immersion, the inward Circle be every where continued, and of an uniform Figure. The less the said Diameter,

and the greater the Excess of the Moon's apparent Diameter above that of the Sun ; as also the greater the apparent Altitude of the Sun is above the Horizon ; the higher the Cause which produces the Crown must be, above the Surface of the Earth. And the Position, upon the Moon's Disk, in reference to the Zenith, of the Points of Contact, where the Sun disappears, or begins to shew itself again, is here also of some consideration. As to the accurate Calculation, it shall be given in another place.

VII. *Pars Epistola à Cl. D. Joh. Jac. Scheuchzer, M. D. Tigur. & Societat. Reg. Lond. Soc. ad D. Jacobum Petiver, dictæ Societ. Soc. de Eclipsi Solis totali Die 12^o. Maij Tiguri observatâ.*

Illustri Societati indica, habuisse nos die 12^o. Maij Eclipsin Solis totalem simul & annularem ; totalem, quoniam Sol integer à Lunâ fuit obiectus ; annularem autem non propriè ita dictam, sed per Refractionem, quandoquidem circa Lunam fulgor apparuit rutilans, à radiis per Atmosphæram Lunæ retractis ortus. *Vide Tab. 2.*

Initium Eclipsæ fuit mane horâ 8. 54'.

Medium horâ 9. 58'.

Finis horâ 11. 12'.

Mora mediæ & plenæ obscurationis 4'.

Quâ visæ fuerunt Stellæ tam fixæ, quàm erraticæ ; ad nidos suos sese receperunt Aves ; prodire é latebris suis Vespertiliones, & Aquæ innatârunt Pisces : Nos autem experti sumus sensum frigoris manifestum ; & in Plantas decedit Ros.

Tiguri d. 21. Maij, 1706.

VIII. *Ann.*